

REMARKS/ARGUMENTS

Compact Disk Submission

The Examiner has asked for a submission of Appendices A and B on a compact disk. Applicants have amended the specification to remove all references to Appendices A and B.

Abstract

The Examiner objected to the abstract because the abstract exceed 150 lines and required a new abstract. A new abstract has been provided that is supported by at least original claim 1 of the application.

Double Patenting

The Examiner rejected claims 1-26 under for double patenting over claims 1-39 of US 5,950,203 and claims 1-39 of US 6,161,104. Applicants traverse.

The application has four pending independent claims: claim 1, 13, 18, and 19. All the pending independent claims 1, 13, 18, and 19 require a cache on the first node that stores administrative data (or meta data) pertaining to files. All the pending independent claims require operations related to the stored administrative data (or meta data) in the cache (or meta data).

Pending independent claims 1, 13, 18, and 19 are patentably distinct over claims 1-39 of US 5,950,203 and claims 1-39 of US 6,161,104 because nowhere do claims 1-39 of US 5,950,203 nor do claims 1-39 of US 6,161,104 require the above requirements of a cache on the first node that stores administrative data (or meta data) pertaining to files, wherein operations are performed related to the stored administrative data (or meta data) in the cache. Therefore, the pending independent claims 1, 13, 18, and 19 are patentably distinct over claims 1-39 of US 5,950,203 and claims 1-39 of US 6,161,104 because the pending independent claims 1, 13, 18,

and 19 include requirements not found in the claims 1-39 of US 5,950,203 and claims 1-39 of US 6,161,104.

Pending dependent claims 2-12, 14-17, 20-26 depend directly or indirectly from independent claims 1, 13, 18, and 19, which are patentably distinct over claims 1-39 of US 5, 950, 203 and claims 1-39 of US 6,161,104 for the reasons discussed above. Therefore, the requirements of pending dependent claims 2-12, 14-17, 20-26 provide further requirements that are patentably distinct over claims 1-39 of US 5, 950, 203 and claims 1-39 of US 6,161,104.

Additionally, the Examiner has mentioned that there is no apparent reason why applicant was prevented for presenting the pending claims during the prosecution of US 5,950,203 and US 6,161,104. However, the Examiner has not shown how the applicants could have added the pending claims during the prosecution of US 5,950,203 and US 6,161,104. In fact, as applicants have shown above, the pending claims include requirement not found in the claims of US 5,950,203 and US 6,161,104.

For the above reasons, the applicants traverse the double patenting rejections of pending claims 1-26.

Minor grammatical errors corrected in claims

Minor grammatical errors have been corrected in the claims.

Obviousness rejections

The Examiner rejected pending claims 1-26 under 35 U.S.C. §103 as being obvious over Horadan (US 5,842,211) in view of Vahalia (US 6,389,420). Applicants traverse and submit that the rejected claims 1-26 are patentable over the cited art and in condition for allowance for the reasons discussed herein.

Claim 1

The Examiner has rejected 1 under 35 §U.S.C. 103 as being obvious over Horadan in view of Vahalia (Office Action: page 5-6). Applicants traverse.

Pending independent claim 1 requires a digital data processing system with improved access to information stored on a storage device, said system comprising a plurality of first nodes and a second node coupled to one another over a communications pathway, the second node being coupled to the storage device for determining meta data including block address maps to file data in the storage device, and the first nodes being configured for accessing file data from the storage device using said meta data, wherein said system comprises:

- at least one first node that caches data including meta data for a file accessed by said first node;

- a file application on said first node configured to get requested file data by accessing said cached data for the file; and

- a file notification system that sends a file change notification to said first node indicating changes affecting the cached data, wherein the file application on the first node inspects the change notification to determine whether to get the requested file data directly using said cached data, whereby file accesses may be effected for an extended time with data locally cached at first nodes of the system.

In rejecting claim 1, the Examiner cites Horadan (FIG. 2; col. 6: lines 27-34; col. 6, line 66 - col. 7, line 9; col. 6: lines 49-65, FIG. 3, col. 7, lines 66 - col. 8 line 12) and Vahalia (222 of FIG. 10; 425 of FIG. 14; col. 5 lines 1-17 and lines 24-35; abstract; col 5. line 30 - col. 6 line 7; col. 3: lines 31-42). Claim 1 requires a first node that caches data including meta data for a file, a file notification system that sends a file change notification to said first node indicating changes affecting the cached data, wherein a file application on the first node inspects the change notification to determine whether to get the requested file data directly using said cached data,

and wherein the data is locally cached at the first node. Neither the cited Horadan nor the cited Vahalia teach or suggest the claim requirements.

Neither the cited Horadan nor the cited Vahalia teach or suggest the claim requirements that the first node locally caches data including the meta data for a file, wherein an application on the first node inspects a file change notification to determine whether to get file data using the locally cached data.

The cited Horadan mentions importing a file automatically from a server to an application running on the first node. In Horadan, a server-based application program creates a file that is written onto the first node (column 8, lines 53-54). In Horadan, the written file is automatically imported into an application running on the first node (column 8, lines 56-63). Nowhere, does the cited Horadan teach or suggest the claim requirement that the the first node locally caches data including metadata for a file. Furthermore, nowhere does the cited Horadan teach or suggest the claim requirement that the first node receives a file change notification. Additionally, nowhere does the cited Horadan teach or suggest the claim requirement that the application running on the first node determines whether to get file data using the locally cached data. In fact, Horadan teaches away from the claim requirements because in Horadan the file data is always obtained by the application from data present in the first node, whereas the claims require a determination is made based on an inspection of the change notification on whether to get the data from the cache in the first node, i.e., the claims require getting file data based on an inspection of the change notification, whereas in Horadan the file data is automatically imported in an application running on the first node.

In the cited Vahalia (col 5 - lines 1-17) there is a cache (the cached disk array 23 of Vahalia) coupled to the second node (File manager 21 of Vahalia), whereas the claims require the first node to cache data including the metadata locally in the first node. In the cited Vahalia the cache is not part of the first node as required by the claims but is in a cached disk array (cache disk array 23 of Vahalia) accessible to the second node that sends the metadata to the first node.

Furthermore, the cited Vahalia does not teach or suggest the claim requirement of examining the change notification in the first node. Therefore, the cited Vahalia does not teach or suggest the claim requirements of the cache including metadata being a part of the first node and the examination of the change notification in the first node.

Even though neither Horadan nor Vahalia teach or suggest the claims requirements the Examiner rejects claim 1 by modifying the teachings of Horadan and Vahalia. According to MPEP §2143.01 (page 2100-124) “fact that references can be combined or modified is not sufficient to establish prima facie obviousness” and “the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” The motivation suggested by the Examiner is that Vahalia (col. 3, lines 31-42) suggests network clients to share access to file data in a data storage, therefore the communication service system of Horadan can be modified with the caching data techniques of Vahalia. However, network clients can share access to file data in a data storage in a number of ways and the specific way required by the claims, i.e., storing metadata locally in a cache in a first node and examining a change notification for determining how to access file data, is not taught or suggested by either Vahalia or Horadan. Therefore, neither Horadan nor Vahalia teaches or suggests the desirability of the claimed combination.

Therefore, neither the cited Vahalia nor the cited Horadan teach or suggest the claim requirements of a first node that caches data including meta data for a file, a file notification system that sends a file change notification to said first node indicating changes affecting the cached data, wherein a file application on the first node inspects the change notification to determine whether to get the requested file data directly using said cached data, and wherein the data is locally cached at the first node.

For the above reason, claim 1 is patentable over the cited art.

Claims 2-12

The Examiner has also rejected pending claims 2-12 that depend directly or indirectly on independent claim 1 which is patentable over the cited art for the reasons discussed above. Moreover, the following of these claims provide additional grounds of patentability over the cited art for the reasons discussed below.

Claim 2

Pending claim 2 depend from claim 1, and add the requirement that the file application on said first node determines whether requested file data is subject to a change notification, and if so makes a further determination whether cached data at said first node remains valid for the requested file data.

The Examiner has cited the abstract of Vahalia in rejecting claim 2. The abstract of Vahalia discusses exchange of locks between a first node and a second node and the accessing of data based on the lock. Nowhere does the cited abstract of Vahalia teach or suggest the claim requirement of determining whether the requested file data is subject to a change notification.

Accordingly claim 2 provides additional grounds of patentability over the cited art.

Claim 3

Pending claim 3 depends from claim 1, and adds the requirement that the file application on said first node,

- i) determines whether requested file data is subject to a change notification, and
- ii) applies the cached meta data to directly mount the storage device to access the requested file when the cached data is not subject to a change notification.

In the cited Vahalia (68 of FIG. 7, 70, 72 of FIG. 7) step 68 is performed if the first node has modified the metadata. The claims require the file application of the first node to determine

whether requested file data is subject to a change notification and nowhere does the cited Vahalia teach or suggest the claim requirement.

Accordingly, claim 3 is patentable over the cited art.

Claim 7

Independent claim 7, depends on claim 1, wherein the file notification system runs on the second node and interfaces with a file system meta data controller to detect changes in file system storage data, issuing a file change notice in response thereto.

The cited Vahalia (col. 22, lines 37 - col. 23, lines 42) refer to software for the first node (client of Vahalia: Vahalia col. 22, line 37) and procedure followed by the first node's operating system (col. 22, line 67). The claims require the file notification system to run on the second node and nowhere does the cited Vahalia teach or suggest the file notification system to run on the second node.

Therefore, claim 7 is patentable over the cited art.

Claim 8

Pending claim 8 depends from claim 1, wherein the file notification system limits number of change notifications for a given file to first n changes that occur, where n is a positive integer.

The cited Vahalia (col. 15, lines 32 to col. 16 lines 41) discusses locks does not require change notifications as required by the claims. Furthermore, the cited Vahalia does not teach or suggest a numerical limit (because n is an integer in the claims) on the number of change notifications.

Therefore, claim 8 is patentable over the cited art.

Claim 9

Claim 9 depends from claim 1, wherein the file application on the first node implements a decision algorithm to determine whether to apply cached data for a requested file when the requested file is subject to a change notification.

Nowhere does the cited Vahalia (67-72 of FIG. 7) teach or suggest that the requested file is subject to change notification as required by the claims. Block 67 of the cited Vahalia discusses whether the client has modified the metadata. This is different from the change notification as required by the claims. The cited Vahalia discusses whether the first node has changed the metadata, whereas the claims require a change notification to be examined at the first node.

Therefore claim 9 is patentable over the cited art.

Claim 11

Claim 11 depends from claim 10, wherein the file system management tasks performed by the second node include publication of change data.

The cited Vahalia (col. 9, lines 49-58) discusses granting locks and comparison of metadata version numbers. Nowhere, does the cited Vahalia teach or suggest the the file system management tasks performed by the second node include publication of change data.

Therefore claim 11 is patentable over the cited art.

Claims 13, 15-17, 18-24, and 26

The Examiner has rejected claims 13, 15-17, 18-24 and 26 based on the analysis of claim 1-7, and 9-12 and Applicant traverses the rejections based on the above arguments for claims 1-7 and 9-12.

Claim 25

Examiner appears not to have indicated specifically why claim 25 has been rejected.

Claims 27-30

The requirements for newly added claims 27-30 may be found in at least pages 5-6 and page 12 of the application.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-30 are patentable over the art of record. Applicants has added four new claims and indicated fees to be charged. Nonetheless, should any additional fees be required, please charge Deposit Account No. 50-0585.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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By: 

Rabindranath Dutta
Registration No. 51,010

Please direct all correspondences to:

David Victor
Konrad Raynes Victor & Mann, LLP
315 South Beverly Drive, Ste. 210
Beverly Hills, CA 90212
Tel: 310-553-7977
Fax: 310-556-7984